

THE DEVELOPMENTAL STAGES OF ENDEODES LECONTE
(COLEOPTERA: MELYRIDAE)

IAN MOORE AND E. F. LEGNER

Division of Biological Control, University of California at Riverside, Riverside,
California 92502

ABSTRACT—The larvae of *Endeodes terminalis* Marshall and *E. rothi* Moore & Legner are described for the first time and a key is given for the five known larvae of the genus. The pupa of *E. terminalis* is described and illustrated for the first time.

The larvae of three species of *Endeodes* have been described (Moore, 1956, 1964). Larvae of two additional species are now available to us. These are described below with a new key to the five known larvae of the nine known species in the genus.

Of the seven species of *Endeodes* which are intertidal in habitat, the larvae are often found with the adults so that larvae of all but two of these (*E. intermedius* and *E. fasciatus*) have been found. Species distribution (see Moore and Legner, 1975) as well as association with adults appears to be a satisfactory criterion for identification of larvae. The larvae of the two species (*E. basalis* and *E. blaisdelli*) which are found under dry seaweed on the berm of the beach have never been found although the adults of *E. basalis* are sometimes common.

KEY TO THE KNOWN LARVAE OF *Endeodes*

- | | |
|--|-------------------------------|
| 1. Body largely piceous | 2 |
| Body largely pale | 3 |
| 2. Urogomphus entirely black | <i>collaris</i> LeConte |
| Urogomphus partly or entirely ferrugineous | <i>insularis</i> Blackwelder |
| 3. Body testaceous or cream colored | 4 |
| Body bright ferrugineous | <i>sonorensis</i> Moore |
| 4. Urogomphus entirely black | <i>terminalis</i> Marshall |
| Urogomphus ferrugineous and testaceous | <i>rothi</i> Moore and Legner |

Larva of *Endeodes terminalis* Marshall

Body subparallel. Body and legs testaceous, head ferrugineous, a little paler in front, piceous between and adjacent to ocelli, mandibles piceous at apices, urogomphus entirely piceous. Head nearly square but with anterior margin arcuate; surface finely reticulate, very sparsely finely pubescent with long but fine setae; with 4 ocelli each side, anterior 3 arranged in a straight line along anterior end of frontal suture. Coronal suture meeting frontal suture at an angle of 130°. Mandible with 3 widely separated teeth at apex, central tooth the longest. Antenna very short, retracted into cavity between base of mandible and

ocelli. Labrum membranous, transverse, apex hardly arcuate. Thorax not chitinized, very finely reticulate and dull, clothed in very fine short pubescence, each segment with strong lateral seta. Pronotum $1\frac{1}{2} \times$ as wide as long; mesonotum about as long as pronotum and about $2 \times$ as wide as long; metanotum about the same dimensions as mesonotum. Abdomen subparallel but slightly wider to 5th segment, thence slightly narrowed to 8th segment; surface finely densely microreticulate; pubescence as on thorax; each segment with long lateral seta; each segment, on each side, with depressed ring with tumid center. Urogomphus not quite $2 \times$ as long as wide, finely densely reticulate, clothed in sparse long setae, not segmented, apices each turned up at the end in a small hook. Legs shining, sparsely pubescent. Length 4.5 mm.

One specimen MEXICO, Baja California Norte, Puertecitos, 31 May 1963, T. Palmer collector. In company with 1 adult and 1 pupa (Canadian National Collection).

Larva of *Endeodes rothi* Moore and Legner

Body subparallel. Body and legs pale cream colored, head pale ferrugineous with the area between and adjacent to the ocelli piceous, mandibles piceous at apex, urogomphus pale ferrugineous. Head nearly square but with anterior margin arcuate; surface very finely microreticulate, very finely sparsely pubescent with a few fine long setae; with 4 ocelli each side, the anterior 3 arranged in a straight line along the anterior end of frontal suture. Coronal suture meeting frontal suture at an angle of 130° . Labrum chitinized, apex gently arcuate. Thorax not chitinized, very finely microreticulate and dull, clothed in short sparse pubescence. Pronotum about as wide as long; mesonotum $\frac{2}{3}$ as long as pronotum, $2 \times$ as wide as long; metanotum a little wider and a little longer than mesonotum. Abdomen almost parallel sided but with 8th segment somewhat narrower than the preceding; surface finely densely microreticulate and dull, with fine sparse short pubescence. Urogomphus about $2 \times$ as long as wide, finely densely microreticulate with long fine sparse setae, apices each with a small turned-up hook at tip. Legs shining, sparsely pubescent. Length 3.0 mm.

Three specimens MEXICO, Sonora, Punta Tepoca (29.18-112.20), 22 May 1974, W. Brown & Speich collectors, "on boulders 6" dia. on rocky beach." In company with 14 adults (University of California at Riverside).

Pupa of *Endeodes terminalis* Marshall

Pupa exarate, elongate, pale cream colored throughout, not chitinized in any part. Body with numerous setae, both large and small, none of which arises from a tubercle. Head strongly reflexed so that no part is visible from above; without ocelli; with curved row of about 8 macrosetae along posterior margin; between bases of antennae with 3 rows of setae, 1st row composed of 4 setae, 2nd and 3rd rows composed of 2 setae each; row of 4 setae at base of labrum; labrum about as long as wide, without macrosetae but with a few small scattered setae; mandibles extending a little beyond apex of labrum, slightly hooked at tip, each with a pair of setae at outer edge; antenna curved dorsally over tibiofemoral joint of anterior legs, without setae but with pair of tubercles on dorsal surface of each of the 6 apical segments. Pronotum pentagonal in shape with angles broadly rounded, base about $2 \times$ as wide as apex; strongly arched along center

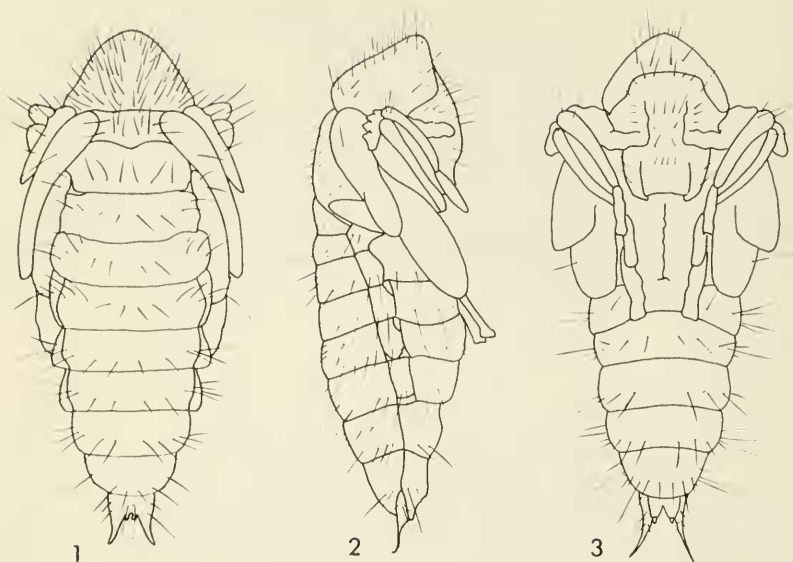


Fig. 1-3. Pupa of *Endeodes terminalis* Marshall. 1, dorsal view. 2, lateral view. 3, ventral view.

line; with numerous setae of various sizes scattered throughout surface; principal macrosetae as follows: Row of 6 evenly spaced along base, 2 or 3 pairs on disc, 1 at each outer angle, 1 midway between outer angle and base, 1 midway between outer angle and apex, 1 pair near apical margin and another pair each slightly basal and lateral to apical pair. Elytra long, narrow, arcuate appressed to the body between middle legs and wings, extending to about apex of 2nd abdominal segment, each with single large seta on disc at basal $\frac{1}{3}$. Wings appressed to the body between elytra and posterior legs, extending not quite to apex of 4th abdominal segment, without setae. Legs slender; the forelegs with group of 3 setae at tibiofemoral joint; middle legs with single seta at tibiofemoral joint; posterior legs without setae. Mesonotum with numerous fine setae and at least 1 row of 3 or 4 macrosetae adjacent to each margin. Metanotum with numerous fine setae and 1 row of 6 macrosetae adjacent to the posterior margin. Abdomen gradually tapered to apex; each segment above and below with row of 4 to 6 discal macrosetae and numerous scattered finer setae. Urogomphi almost as long as penultimate abdominal segment, divided from about the middle into 2 pointed cones, base of each cone broad, tapered gradually to about $\frac{1}{2}$ the distance to apex, thence narrowed slightly and tapered to fine point. An unidentified paired structure ventral to the urogomphi bears a small papilla at apex of each member; the papillae are the only parts visible dorsally. In the tenebrionid genus *Trilobium*, Good (1936) describes a similar structure as "two cone-like appendages similar in appearance to the urogomphi, but shorter . . ." which he says are characteristic of female pupae. Length 3.8 mm.

One specimen MEXICO, Baja California Norte, Puertectios, 31 May, 1963, T. Palmer collector. In company with 1 adult and 1 larva (Canadian National Collection).

The pupae of Coleoptera are so poorly known that it is difficult to choose with certainty characters which will be of diagnostic value. However, studies by Rozen (1959, 1963a, 1963b) indicate that the location of tuberculate setae on various parts of the body are particularly useful. The pupa of *Endeodes terminalis* has numerous setae of various sizes but none of these arises from a tubercle. Among other characters, a description is given here of the location of the larger setae (macrosetae).

A pupa doubtfully identified as *E. insularis* was illustrated but not described by Moore (1956). The chaetaxy was not indicated. That pupa is easily distinguished from the pupa of *E. terminalis* by its very short elytra which do not reach past the apex of the mesonotum and by the lack of wings.

We gratefully acknowledge the assistance of Lauren D. Anderson, J. Milton Campbell, Vincent Lee, Robert E. Orth, Tom Palmer, William Peet and Vincent Roth in this study.

REFERENCES

- Good, N. W. 1936. The flour beetles of the genus *Tribolium*. U.S. Dep. Agric. Tech. Bull. No. 498. 58 p.
- Moore, I. 1956. Notes on some intertidal Coleoptera with descriptions of the early stages (Carabidae, Staphylinidae, Malachiidae). San Diego Soc. Nat. Hist. Mem. 12:207-230.
- . 1964. A new species of *Endeodes* from Sonora, Mexico (Coleoptera: Melyridae). Pan-Pac. Entomol. 40:57-58.
- Moore, Ian and E. F. Legner. 1975. Revision of the genus *Endeodes* LeConte with a tabular key to the species (Coleoptera: Melyridae). J. N. Y. Entomol. Soc. 83:70-81.
- Rozen, J. 1959. Systematic study of the pupae of the Oedermeridae (Coleoptera). Ann. Entomol. Soc. Am. 52:279-303.
- . 1963a. Two pupae of the primitive suborder Archostemata (Coleoptera). Proc. Entomol. Soc. Wash. 65:307-310.
- . 1963b. Preliminary systematic study of the pupae of the Nitidulidae (Coleoptera). Am. Mus. Novit. 2124:1-13.